

SEQUENCE LISTING

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Konrad, Manfred
Ravandi, Farhad

<120> Use of Specifically Engineered Enzymes to Enhance the Efficacy of Prodrugs

<130> 02-134-D

<160> 5

<170> PatentIn version 3.0

<210> 1

<211> 260

<212> PRT

<213> Homo sapiens

<400> 1

Met Ala Thr Pro Pro Lys Arg Ser Cys Pro Ser Phe Ser Ala Ser Ser
1 5 10 15

Glu Gly Thr Arg Ile Lys Lys Ile Ser Ile Glu Gly Asn Ile Ala Ala
20 25 30

Gly Lys Ser Thr Phe Val Asn Ile Leu Lys Gln Leu Cys Glu Asp Trp
35 40 45

Glu Val Val Pro Glu Pro Val Ala Arg Trp Cys Asn Val Gln Ser Thr
50 55 60

Gln Asp Glu Phe Glu Glu Leu Thr Met Ser Gln Lys Asn Gly Gly Asn
65 70 75 80

Val Leu Gln Met Met Tyr Glu Lys Pro Glu Arg Trp Ser Phe Thr Phe
85 90 95

Gln Thr Tyr Ala Cys Leu Ser Arg Ile Arg Ala Gln Leu Ala Ser Leu
100 105 110

Asn Gly Lys Leu Lys Asp Ala Glu Lys Pro Val Leu Phe Phe Glu Arg
115 120 125

Ser Val Tyr Ser Asp Arg Tyr Ile Phe Ala Ser Asn Leu Tyr Glu Ser
130 135 140

Glu Cys Met Asn Glu Thr Glu Trp Thr Ile Tyr Gln Asp Trp His Asp
145 150 155 160

Trp Met Asn Asn Gln Phe Gly Gln Ser Leu Glu Leu Asp Gly Ile Ile
165 170 175

Tyr Leu Gln Ala Thr Pro Glu Thr Cys Leu His Arg Ile Tyr Leu Arg
180 185 190

Gly Arg Asn Glu Glu Gln Gly Ile Pro Leu Glu Tyr Leu Glu Lys Leu
 195 200 205

His Tyr Lys His Glu Ser Trp Leu Leu His Arg Thr Leu Lys Thr Asn
 210 215 220

Phe Asp Tyr Leu Gln Glu Val Pro Ile Leu Thr Leu Asp Val Asn Glu
 225 230 235 240

Asp Phe Lys Asp Lys Tyr Glu Ser Leu Val Glu Lys Val Lys Glu Phe
 245 250 255

Leu Ser Thr Leu
 260

<210> 2
 <211> 277
 <212> PRT
 <213> Homo sapiens

<400> 2

Met Ala Ala Gly Arg Leu Phe Leu Ser Arg Leu Arg Ala Pro Phe Ser
 1 5 10 15

Ser Met Ala Lys Ser Pro Leu Glu Gly Val Ser Ser Ser Arg Gly Leu
 20 25 30

His Ala Gly Arg Gly Pro Arg Arg Leu Ser Ile Glu Gly Asn Ile Ala
 35 40 45

Val Gly Lys Ser Thr Phe Val Lys Leu Leu Thr Lys Thr Tyr Pro Glu
 50 55 60

Trp His Val Ala Thr Glu Pro Val Ala Thr Trp Gln Asn Ile Gln Ala
 65 70 75 80

Ala Gly Asn Gln Lys Ala Cys Thr Ala Gln Ser Leu Gly Asn Leu Leu
 85 90 95

Asp Met Met Tyr Arg Glu Pro Ala Arg Trp Ser Tyr Thr Phe Gln Thr
 100 105 110

Phe Ser Phe Leu Ser Arg Leu Lys Val Gln Leu Glu Pro Phe Pro Glu
 115 120 125

Lys Leu Leu Gln Ala Arg Lys Pro Val Gln Ile Phe Glu Arg Ser Val
 130 135 140

Tyr Ser Asp Arg Tyr Ile Phe Ala Lys Asn Leu Phe Glu Asn Gly Ser
 145 150 155 160

Leu Ser Asp Ile Glu Trp His Ile Tyr Gln Asp Trp His Ser Phe Leu
 165 170 175

Leu Trp Glu Phe Ala Ser Arg Ile Thr Leu His Gly Phe Ile Tyr Leu
 180 185 190

Gln Ala Ser Pro Gln Val Cys Leu Lys Arg Leu Tyr Gln Arg Ala Arg
 195 200 205

Glu Glu Glu Lys Gly Ile Glu Leu Ala Tyr Leu Glu Gln Leu His Gly
 210 215 220

Gln His Glu Ala Trp Leu Ile His Lys Thr Thr Lys Leu His Phe Glu
 225 230 235 240

Ala Leu Met Asn Ile Pro Val Leu Val Leu Asp Val Asn Asp Asp Phe
 245 250 255

Ser Glu Glu Val Thr Lys Gln Glu Asp Leu Met Arg Glu Val Asn Thr
 260 265 270

Phe Val Lys Asn Leu
 275

<210> 3
 <211> 250
 <212> PRT
 <213> Drosophila

<400> 3

Met Ala Glu Ala Ala Ser Cys Ala Arg Lys Gly Thr Lys Tyr Ala Glu
 1 5 10 15

Gly Thr Gln Pro Phe Thr Val Leu Ile Glu Gly Asn Ile Gly Ser Gly
 20 25 30

Lys Thr Thr Tyr Leu Asn His Phe Glu Lys Tyr Lys Asn Asp Ile Cys
 35 40 45

Leu Leu Thr Glu Pro Val Glu Lys Trp Arg Asn Val Asn Gly Val Asn
 50 55 60

Leu Leu Glu Leu Met Tyr Lys Asp Pro Lys Lys Trp Ala Met Pro Phe
 65 70 75 80

Gln Ser Tyr Val Thr Leu Thr Met Leu Gln Ser His Thr Ala Pro Thr
 85 90 95

Asn Lys Lys Leu Lys Ile Met Glu Arg Ser Ile Phe Ser Ala Arg Tyr
 100 105 110

Cys Phe Val Glu Asn Met Arg Arg Asn Gly Ser Leu Glu Gln Gly Met
 115 120 125

Tyr Asn Thr Leu Glu Glu Trp Tyr Lys Phe Ile Glu Glu Ser Ile His
 130 135 140

Val Gln Ala Asp Leu Ile Ile Tyr Leu Arg Thr Ser Pro Glu Val Ala
 145 150 155 160

Tyr Glu Arg Ile Arg Gln Arg Ala Arg Ser Glu Glu Ser Cys Val Pro

165	170	175
Leu Lys Tyr Leu Gln Glu Leu His Glu Leu His Glu Asp Trp Leu Ile		
180	185	190
His Gln Arg Arg Pro Gln Ser Cys Lys Val Leu Val Leu Asp Ala Asp		
195	200	205
Leu Asn Leu Glu Asn Ile Gly Thr Glu Tyr Gln Arg Ser Glu Ser Ser		
210	215	220
Ile Phe Asp Ala Ile Ser Ser Asn Gln Gln Pro Ser Pro Val Leu Val		
225	230	235
		240
Ser Pro Ser Lys Arg Gln Arg Val Ala Arg		
245	250	
<210> 4		
<211> 232		
<212> PRT		
<213> Homo sapiens		
<400> 4		
Val Gln Arg Tyr Ala Trp Pro Pro Asp Lys Glu Gln Glu Lys Glu Lys		
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		15
Lys Ser Val Ile Cys Val Glu Gly Asn Ile Ala Ser Gly Lys Thr Thr		
20	25	30
Cys Leu Glu Phe Phe Ser Asn Ala Thr Asp Val Glu Val Leu Thr Glu		
35	40	45
Pro Val Ser Lys Trp Arg Asn Val Arg Gly His Asn Pro Leu Gly Leu		
50	55	60
Met Tyr His Asp Ala Ser Arg Trp Gly Leu Thr Leu Gln Thr Tyr Val		
65	70	75
		80
Gln Leu Thr Met Leu Asp Arg His Thr Arg Pro Gln Val Ser Ser Val		
85	90	95
Arg Leu Met Glu Arg Ser Ile His Ser Ala Arg Tyr Ile Phe Val Glu		
100	105	110
Asn Leu Tyr Arg Ser Gly Lys Met Pro Glu Val Asp Tyr Val Val Leu		
115	120	125
Ser Glu Trp Phe Asp Trp Ile Leu Arg Asn Met Asp Val Ser Val Asp		
130	135	140
Leu Ile Val Tyr Leu Arg Thr Asn Pro Glu Thr Cys Tyr Gln Arg Leu		
145	150	155
		160
Lys Lys Arg Cys Arg Glu Glu Glu Lys Val Ile Pro Leu Glu Tyr Leu		
165	170	175

Glu Ala Ile His His Leu His Glu Glu Trp Leu Ile Lys Gly Ser Leu
180 185 190

Phe Pro Met Ala Ala Pro Val Leu Val Ile Glu Ala Asp His His Met
195 200 205

Glu Arg Met Leu Glu Leu Phe Glu Gln Asn Arg Asp Arg Ile Leu Thr
210 215 220

Pro Glu Asn Arg Lys His Cys Pro
225 230

<210> 5
<211> 260
<212> PRT
<213> Artificial

<220>
<223> Modified deoxycytidine kinase

<400> 5

Met Ala Thr Pro Pro Lys Arg Ser Cys Pro Ser Phe Ser Ala Ser Ser
1 5 10 15

Glu Gly Thr Arg Ile Lys Lys Ile Ser Ile Glu Gly Asn Ile Ala Ala
20 25 30

Gly Lys Ser Thr Phe Val Asn Ile Leu Lys Gln Leu Cys Glu Asp Trp
35 40 45

Glu Val Val Pro Glu Pro Val Ala Arg Trp Cys Asn Val Gln Ser Thr
50 55 60

Gln Asp Glu Phe Glu Glu Leu Thr Met Ser Gln Lys Asn Gly Gly Asn
65 70 75 80

Val Leu Gln Met Met Tyr Glu Lys Pro Glu Arg Trp Ser Phe Thr Phe
85 90 95

Gln Thr Tyr Val Cys Leu Ser Met Ile Arg Ala Gln Leu Ala Ser Leu
100 105 110

Asn Gly Lys Leu Lys Asp Ala Glu Lys Pro Val Leu Phe Phe Glu Arg
115 120 125

Ser Val Tyr Ser Ala Arg Tyr Ile Phe Ala Ser Asn Leu Tyr Glu Ser
130 135 140

Glu Cys Met Asn Glu Thr Glu Trp Thr Ile Tyr Gln Asp Trp His Asp
145 150 155 160

Trp Met Asn Asn Gln Phe Gly Gln Ser Leu Glu Leu Asp Gly Ile Ile
165 170 175

Tyr Leu Gln Ala Thr Pro Glu Thr Cys Leu His Arg Ile Tyr Leu Arg
180 185 190

Gly Arg Asn Glu Glu Gln Gly Ile Pro Leu Glu Tyr Leu Glu Lys Leu
195 200 205

His Tyr Lys His Glu Ser Trp Leu Leu His Arg Thr Leu Lys Thr Asn
210 215 220

Phe Asp Tyr Leu Gln Glu Val Pro Ile Leu Thr Leu Asp Val Asn Glu
225 230 235 240

Asp Phe Lys Asp Lys Tyr Glu Ser Leu Val Glu Lys Val Lys Glu Phe
245 250 255

Leu Ser Thr Leu
260